Surname	Centre Number	Candidate Number
Other Names		0

GCSE

3310U10-1

S19-3310U10-1

MATHEMATICS – NUMERACY
UNIT 1: NON-CALCULATOR
FOUNDATION TIER

TUESDAY, 7 MAY 2019 – MORNING

1 hour 30 minutes

ADDITIONAL MATERIALS

The use of a calculator is not permitted in this examination.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet. Question numbers must be given for the work written on the continuation page.

Take π as 3·14.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

In question **4***(a)*, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**7**	
2.	**4**	
3.	**5**	
4.	**11**	
5.	**4**	
6.	**6**	
7.	**4**	
8.	**14**	
9.	**8**	
10.	**2**	
Total	**65**	

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01

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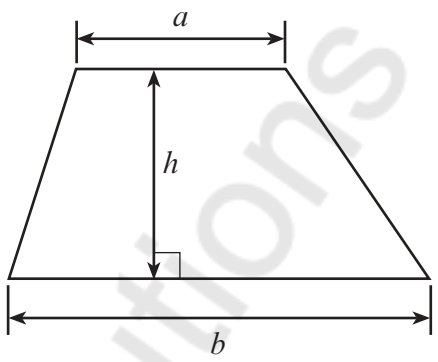
Formula List - Foundation Tier

Area of trapezium $= \frac{1}{2}(a + b)h$



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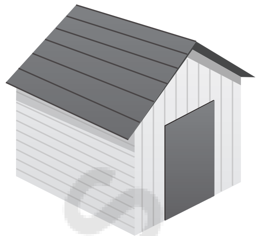
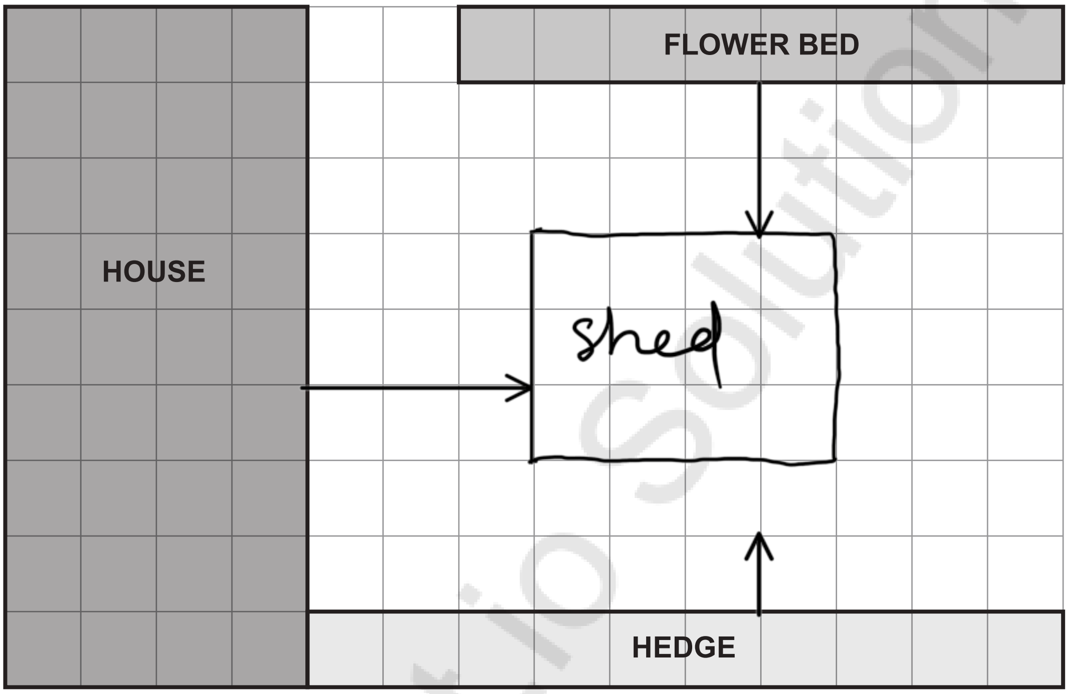
Examiner only

1. Elwyn wants to put a shed in his garden.



(a) The diagram below shows a plan of his garden.
The scale is 1 cm represents 1 m.
It shows the position of the house, the hedge and the flower bed.



Scale: 1 cm represents 1 m

The base of Elwyn's shed is rectangular. It is 4 m long and 3 m wide.

He wants the shed to be:
- at least 3 m from the house,
- at least 1 m from the hedge,
- exactly 2 m from the flower bed.

4m × 3m

Draw a possible position for the shed on the diagram. [3]

(b) Elwyn wants to cover the base of the shed with carpet tiles.
The carpet tiles cost £15 for each 1 m^2.
Calculate the total cost of the carpet tiles. [3]

A = L × B
4 × 3
= 12 m^2
15 × 12
= £180

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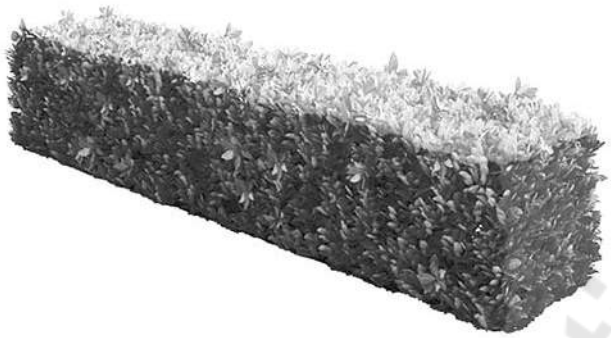
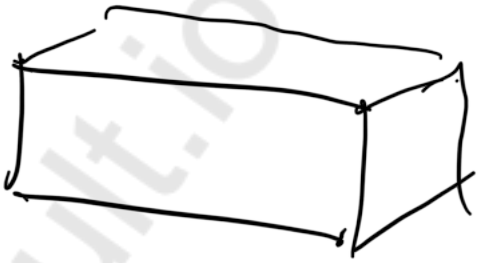
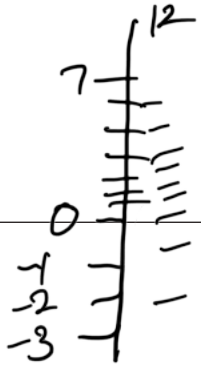
(c) This is a picture of Elwyn's hedge.



Which of the words below best describes the shape of the hedge?
Circle your answer. [1]

sphere cylinder cone cube cuboid





7 + 9 = -2

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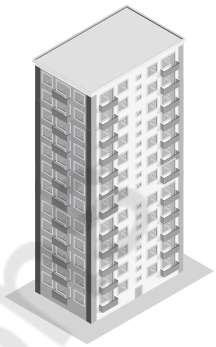
2. An apartment block is 12 floors high.
It also has 3 floors of underground parking.



All floors are connected by a lift.
The ground floor is labelled *Level 0* in the lift.

The first floor of underground parking is one floor below the ground floor.
It is labelled *Level –1* in the lift.

(a) What is the third floor of underground parking labelled in the lift?
Circle your answer. [1]

Level 3 *Level –3* *Level –2* *Level 13* *Level 2*

(b) Jen is at *Level 7*.
She travels down 9 floors to where she parks her car.
What level is this labelled in the lift? [1]

level −2

(c) Anna parks her car on the floor that is labelled *Level –1* in the lift.
She travels up 10 floors to her apartment to collect a present for her friend, Brodie.
She then travels down 5 floors to Brodie's apartment.
What level is Brodie's apartment labelled in the lift? [2]

−1 + 10 = 9
9 − 5 = 4

level 4

Examiner only

3.

Gwenda wants to raise money for the children's ward of her local hospital.
She would like to complete a sponsored walk of 90 miles along part of the coastal path of Wales.

(a) Gwenda is sponsored a total of £3 per mile by her family and friends.
Also, a local company will give her 40% of the total amount she receives from her family and friends.
How much money will the local company give Gwenda if she completes the walk? [3]

£3 = 1 mile
40%
£x = 90 miles
x = 90 × 3
= £270

$\frac{40}{100} \times 270$
$= 27 \times 4$
$= £108$

Local company would give Gwenda
= £108

(b) Gwenda knows that 5 miles is approximately 8 kilometres.
How many kilometres is 90 miles? [2]

5 mile ≈ 8 km
90 miles = x
$x = \frac{90 \times 8}{5}$
$= 18 \times 8$
$= 144$ km

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07

Examiner only

4. A local community group is going to have a stall selling lemonade at a summer fete.
The group needs to buy cups and bottles of lemonade.

Each bottle of lemonade contains 1000 ml and costs 90p.
One packet of 100 cups costs £4.

The group plans to buy enough to sell 300 cups of lemonade.
Each cup will contain 200 ml of lemonade.

(a) In this part of the question, you will be assessed on the quality of your organisation, communication and accuracy in writing.

How much will it cost to buy everything that is needed to sell 300 cups of lemonade?
[6 + 2 OCW]

1 bottle of L = 1000ml = 90p

1 packet = 100 cups = £4

1 cup = 200ml

Cost of 3 packet of cups = 3 × 4 = £12

300 cups = x

x = 300 × 200

= 60,000 ml

1 = 1000 ml

x = 60,000 ml

x = ~~60000~~ 60 = 60 bottles
~~1000~~

60 × 90 = 5400p
£54

Total cost = £12 + £54

= £66

(Cost price)

Examiner only

(b) The community group sells each cup of lemonade for 50p.
How much profit will the community group make if they sell all 300 cups of lemonade? [3]

300×50 Selling Price SP

$= 15000p$ or £150

profit = SP − CP

$150 - 66$

$= £84$

Examiner only

5. Climbers use the rule that the temperature decreases by 6˚C for every 1000 m that they climb.

This can be written as a formula:

$$\text{temperature loss} = \frac{6 \times \text{gain in height in metres}}{1000}$$

Mary plans to climb Snowdon in Wales before she climbs Mount Kilimanjaro in Africa.

The table below gives the gain in height when climbing each mountain.
The gain in height is given in metres.

Mountain		Gain in height
Snowdon		945 metres ≈ 1000m
Mount Kilimanjaro		4085 metres ≈ 4000m

Estimate the temperature loss when Mary climbs each mountain.
You must show all your working. [4]

Temp loss of Snowdon $= \frac{6 \times 1000}{1000}$

$= 6°C$

Temp loss Kilimanjaro $= \frac{6 \times 4000}{1000}$

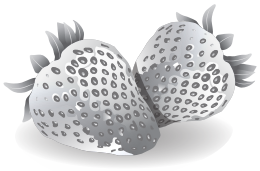
$= 24°C$

Estimate of Snowdon temperature loss = 6° ˚C

Estimate of Mount Kilimanjaro temperature loss = 24° ˚C

Examiner only

6. Sioned works in a grocery shop.
She has made a poster for the window of the shop.



Strawberries
£8.60 per kg

Raspberries
Today's special offer

..... per kg

Sioned has forgotten to write the price of raspberries on the poster.

Mr Thomas buys $\frac{1}{4}$ kg of strawberries and $1\frac{1}{2}$ kg of raspberries.

He pays with a £20 note.
He gets £2.55 change.

Calculate the price of 1 kg of raspberries.
You must show all your working. [6]

CP of both = £20 − £2.55

= £17.45

$\frac{1}{4}(8.6) + \frac{3}{2}x = 17.45$

$8.6 + 6x = 59.80$

$6x = 59.80 - 8.60$

$6x = 51.2$

$x = \frac{51.2}{6}$

$x = £10.2$

price of 1 kg of raspberries = £10.20

17.45 × 4 = 59.80

59.80 − 8.60 = 51.20

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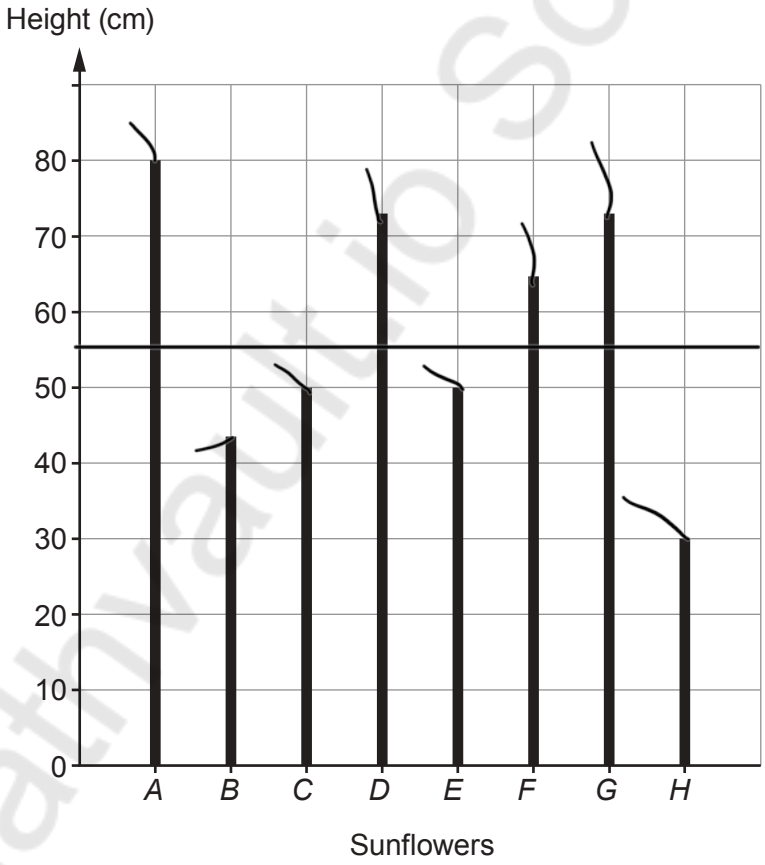
7. Sunflower seeds come in a packet.

> Sunflower seeds
>
> Plant in May
>
> Grow to heights of up to 90 cm (36 inches)

Dieter planted 8 sunflower seeds in May.
He labelled the sunflowers *A*, *B*, *C*, *D*, *E*, *F*, *G* and *H*.

On 21st August, he measured the heights of all the sunflower plants in cm.

Dieter then drew a graph, as shown below.



>55 = 4
<55 = 4

4 : 4
1 : 1

Examiner only

(a) Use the graph to answer each of the following questions.

(i) What fraction of the height of the tallest sunflower is the height of the shortest sunflower?
Circle your answer. [1]

$\frac{3}{10}$ $\frac{3}{7}$ $\frac{3}{5}$ $\frac{3}{8}$ $\frac{3}{80}$

(ii) What is the ratio of the number of sunflowers with heights less than 55 cm to the number of sunflowers with heights greater than 55 cm?
Circle your answer. [1]

5 : 3 3 : 5 1 : 3 3 : 1 1 : 1

< 55 : > 55
1 : 1

(b) Dieter's friend, Glyn, also planted sunflower seeds.
Glyn's tallest sunflower grew to a height of 24 inches.
Is this taller or shorter than Dieter's tallest sunflower?
You must show all your working to support your answer. [2]

Taller than Dieter's tallest sunflower ☐

Shorter than Dieter's tallest sunflower ☑

1 inch = 2·5 cm
24 × 2·5 = 60 cm (Glyn's)
80 > 60
it is shorter than Dieter's tallest flower

Examiner only

8 . Aled and Gareth went on holiday to France.

(a) The total cost of the holiday was £660.

- Aled's mother paid $\frac{1}{3}$ of the total cost.
- Aled and Gareth shared the remaining cost in the ratio 1 : 9.

(i) Calculate how much each person paid towards the cost of the holiday. [4]

T = £660

A = $\frac{1}{3}$ × 660 = £220

660 − 220 = £440 remaining cost

1 : 9

1 + 9 = 10

Aled = $\frac{1}{10}$ × 440 = £44

Gareth $\frac{9}{10}$ × 440 = £396

Aled's mother paid £ £220

Aled paid £ £44

Gareth paid £ £396

(ii) Explain how you could use your answers to check that they are correct. [1]

Add them up i.e (220 + 44 + 396) = 660

Examiner only

(b) Gareth's luggage weighed 21·13 kg.
This was over the maximum of 20 kg allowed.

1.13kg

Gareth removed items from his luggage so that its mass was:

- as close to 20 kg as possible,
- **not greater** than 20 kg.

From the following list of items, which **two** items did Gareth remove?
You must show all your working. [3]

Coat	Headphones	Jumper	Book	Hat
820 g	300 g	320 g	340 g	200 g

2.13 − 20

= 1.13 kg above the max

820 820

340 320

1160 1140

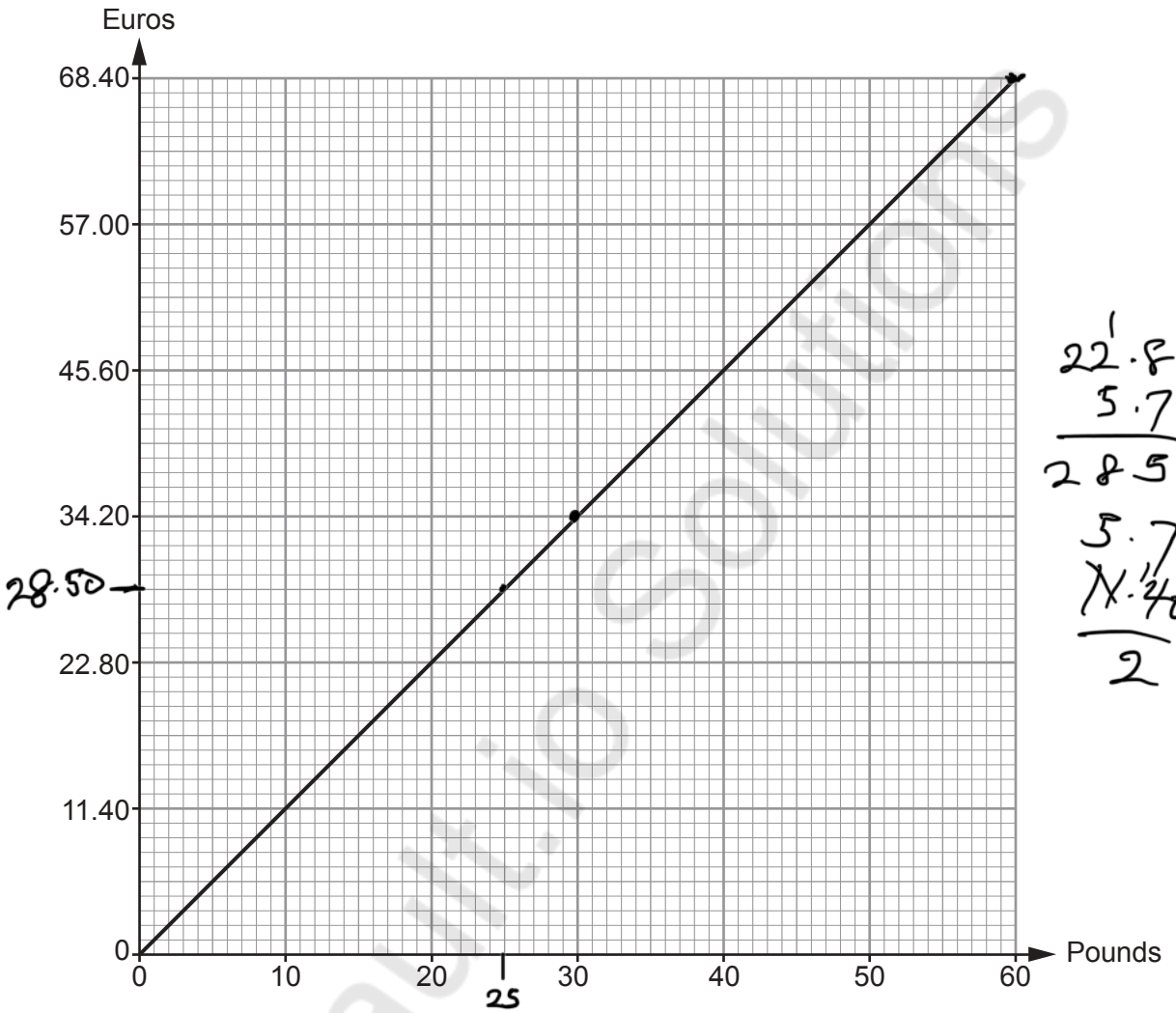
1000 1000

1.16 1.14

gareth removed a coat and a jumper

Examiner only

(c) Before going on holiday, Aled made a conversion graph to help him understand prices in euros.



22.8 × 5.7 = 285
5.7 × 11.40 = 2

Use Aled's conversion graph to answer the following questions.

(i) A camera costs £90.
How much is this in euros? [2]

60 + 30
68.40 + 34.20 = 102.60

Camera costs 102.60 euros

(ii) A meal costs £25.
How much is this in euros? [2]

20 + 5 or 25
= 28.50

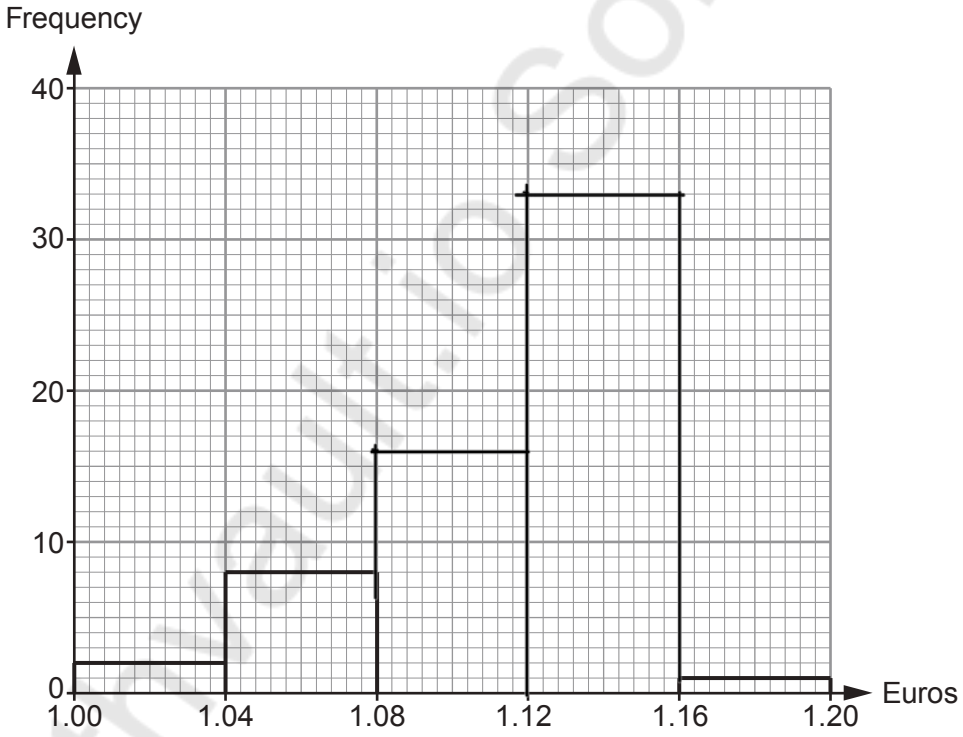
Meal costs 28.50 euros

Examiner only

(d) Gareth looked at exchange rates for buying euros.
He recorded the exchange rates for the previous 60 days, as shown below.

£1 = b euros	Frequency
$1.00 \leqslant b < 1.04$	2
$1.04 \leqslant b < 1.08$	8
$1.08 \leqslant b < 1.12$	16
$1.12 \leqslant b < 1.16$	33
$1.16 \leqslant b < 1.20$	1

Gareth started to draw a frequency diagram to show this information.



(i) Complete the frequency diagram. [1]

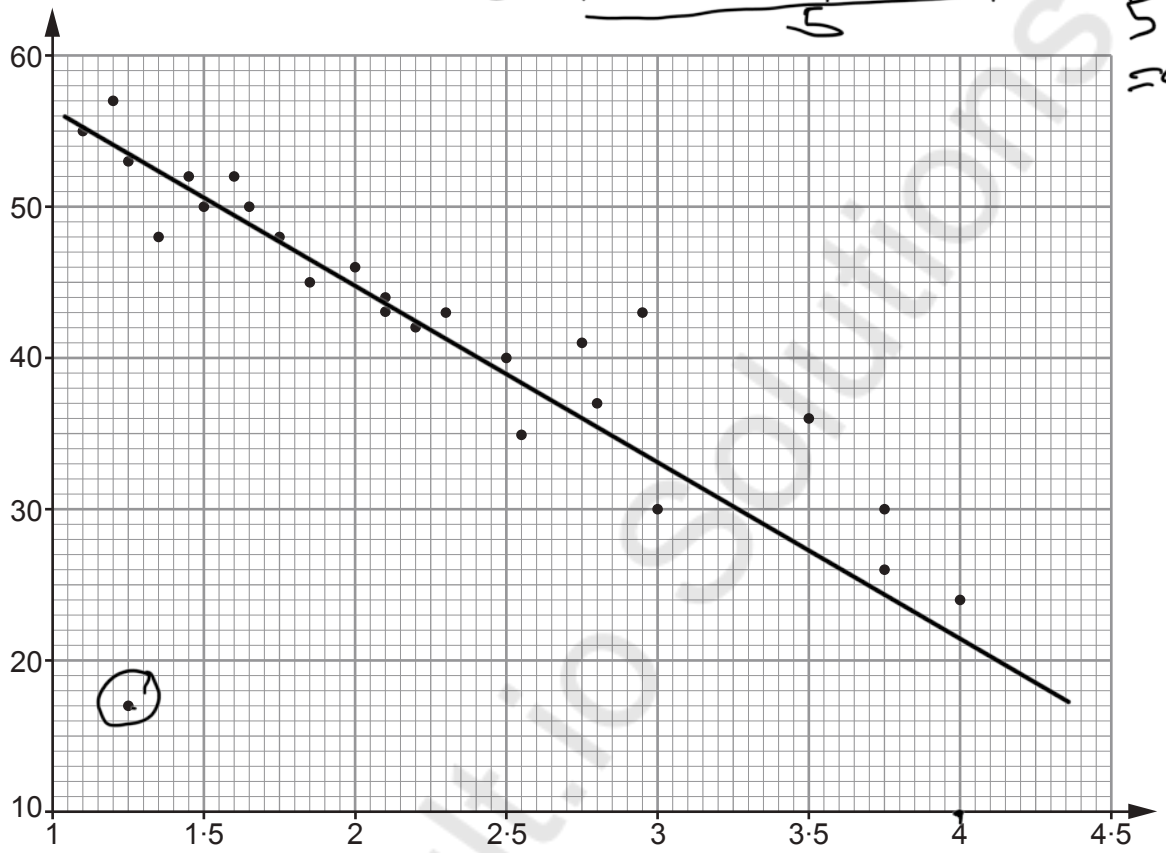
(ii) Which is the modal group?
Circle your answer. [1]

60 $1.08 \leqslant b < 1.12$ 33 $1.12 \leqslant b < 1.16$ 16

Examiner only

9. The distance a car will travel using 1 gallon of fuel is called its fuel economy.
The fuel economy of a number of cars with different engine sizes is shown below.

Fuel economy (miles per gallon)



Use the scatter diagram to answer the following questions.

(a) State the fuel economy of the car with the largest engine size. [1]

Fuel economy ..... miles per gallon

(b) State the engine size of the car with a fuel economy of 42 miles per gallon. [1]

Engine size ..... litres

Examiner only

(c) (i) Calculate the mean fuel economy of the 5 cars with the **smallest** engine sizes. [3]

$$\frac{55+57+53+17+48}{5}$$

$$\frac{230}{5}$$

$= 46$ miles per gallon

Mean fuel economy is 46 miles per gallon

(ii) Why is this not a suitable average for cars with engine sizes of less than 1·5 litres? [1]

17 is an anomaly / an outlier

(d) Draw, by eye, a line of best fit on the scatter diagram. [1]

(e) Siân says,

> The scatter diagram is more reliable to estimate the fuel economy of cars with engine sizes less than 2·5 litres.

Do you think Siân is correct?

Yes ☑ No ☐ Don't Know ☐

You must give a reason for your answer. [1]

Yes, there are more cars with engines less than 2.5L

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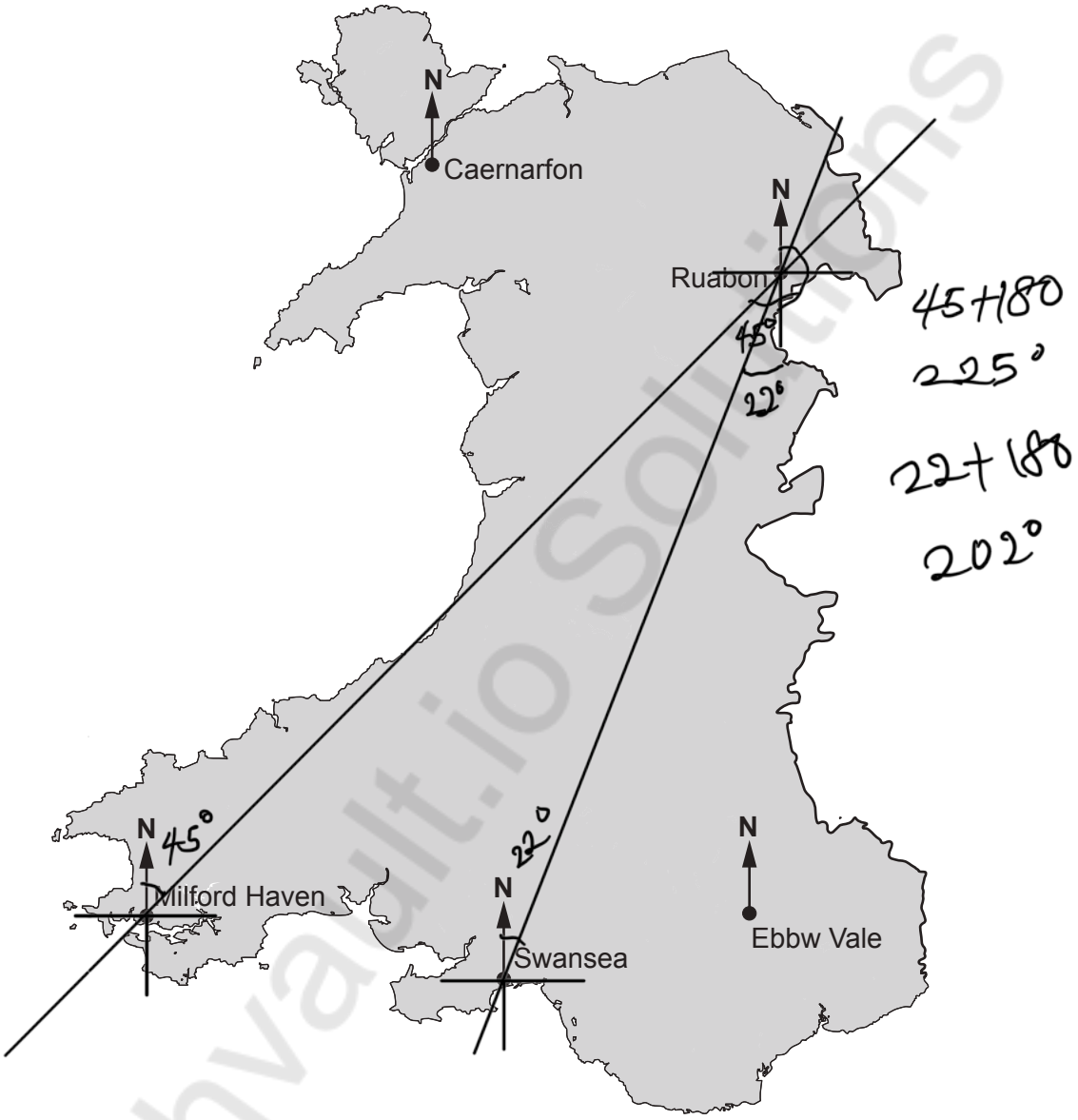
10. A helicopter pilot is planning a route from Milford Haven to Ruabon and then on to Swansea. To plan the flights, the pilot needs to find the bearings from a map.



(a) Find the bearing of Ruabon from Milford Haven. [1]

045°

(b) Find the bearing of Swansea from Ruabon. [1]

202°

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